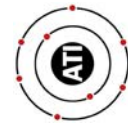
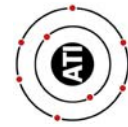


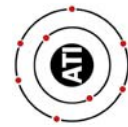
**FINAL SITE-SPECIFIC FINAL REPORT (Revision 1)**  
**Ordnance and Explosive (OE) Response Action**  
Sierra Army Depot, East Shore Honey Lake BRAC Parcels  
Herlong, California



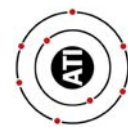
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**Sierra Army Depot, East Shore Honey Lake BRAC Parcels**  
**Herlong, California**

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PREPARED FOR:

U.S. ARMY ENGINEERING AND SUPPORT CENTER, HUNTSVILLE



Contract No.: DACA87-00-D-0035

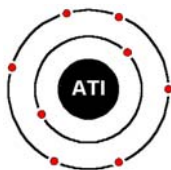
Task Order 0022

Project Number: CASIER02SPK

Geographical District: Sacramento, CA

PREPARED BY:

American Technologies, Inc.



March 21, 2005

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## **List of Acronyms**

ATI	American Technologies, Inc.
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEHNC	U.S. Army Corps of Engineers, Huntsville
CWM	Chemical Warfare Materiel
DID	Data Item Description
DoD	Department of Defense
FBS	Full Band Spectrum
GPS	Global Positioning System
MR	Munitions Response
NCP	National Contingency Plan
OE	Ordnance and Explosives
OSHA	Occupational Safety and Health Act
PEL	Permissible Exposure Level
PPE	Personal Protection Equipment
QA	Quality Assurance
QC	Quality Control
QCI	Quality Conformance Inspection
QCIR	Quality Conformance Inspection Report
SIAD	Sierra Army Depot
SOW	Statement of Work
SUXOS	Senior UXO Supervisor
TCLP	Toxicity Criteria Leaching Procedure
TCRA	Time Critical Removal Action
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance
UXOQCS	Unexploded Ordnance Quality Control Specialist
UXOSO	Unexploded Ordnance Site Safety Officer

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**FINAL  
SITE-SPECIFIC FINAL REPORT (Revision 1)  
ORDNANCE AND EXPLOSIVES (OE) RESPONSE ACTION  
EAST SHORE BRAC PARCELS, HONEY LAKE DEMOLITION AREA,  
SIERRA ARMY DEPOT, HERLONG, CALIFORNIA**

**1.0 INTRODUCTION**

**1.1 Project Scope**

1.1.1 This report summarizes the removal action activities conducted at the East Shore Honey Lake Base Realignment and Closure (BRAC) Parcel, which is part of the Former Honey Lake Demolition Range located in the northwest corner of the Sierra Army Depot (SIAD), California. It is adjacent to the unincorporated community of Herlong in the Honey Lake area of Lassen County, California, approximately 40 miles Southeast of Susanville, California, and 55 miles Northwest of Reno.

1.1.2 This report addresses clearance of the 1,049-acre parcel. All areas within this parcel were cleared, including any wetlands and cultural/historic areas.

**1.2 Removal Report Layout**

1.2.1 This removal report consists of an introduction describing the project background and objectives; a discussion of the ordnance and removal action; the project documentation; a summary of quality control/quality assurance (QA/QC) testing and documentation; and a summary and conclusions. Appendices to this report include:

- Appendix A – Statement of Work (SOW)
- Appendix B – Site Maps
- Appendix C – List of Recovered Ordnance
- Appendix D – Grid Tracking Log
- Appendix E – Site Photos
- Appendix F – Site SUXOS Daily Reports
- Appendix G – UXOQCS Quality Conformance Inspection Report (QCIR)
- Appendix H – CEHNC Form 948 (Revised)
- Appendix I – DD Form 1348-1A, Issue Release/Receipt Document - Scrap
- Appendix J – Financial Break Down
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- Appendix L – Ordnance and Explosive Residue Shipping Documents

Appendix M – Scrap Dealer Smelter Letter of Understanding  
Appendix N – Lead-Contaminated Soil Sampling Results, Transport  
Manifests, and Certification of Disposal  
Appendix O – Asbestos Results

### **1.3 Project Background**

- 1.3.1 American Technologies, Inc. (ATI) received Task Order 0022 on Contract Number DACA87-00-D-0035 issued by the U.S. Army Engineering and Support Center, Huntsville (CEHNC) on March 4, 2004. The original SOW was subsequently modified and the final SOW is provided in Appendix A. The objective of the removal action was to safely locate, identify, and dispose of all surface and subsurface metal, ordnance and explosives (OE), and ordnance-related scrap the size of a 20mm projectile or larger located within the East Shore Honey Lake BRAC Parcel. The work required under this SOW falls under the BRAC Program. OE exists on property owned or leased by the Department of Army, and hazards exist as a result of Department of Defense activities.
- 1.3.2 The original SOW was modified to reflect the clearance of the 50-Caliber Hill, which had been initially excluded and included the excavation and disposal of lead-contaminated soils associated with the 50-Caliber Hill.
- 1.3.3 During the removal action, unanticipated conditions were encountered, including the discovery of buried munitions, below 4 ft in depth, and the identification of asbestos with some of the buried munitions. The SOW was modified to address excavation of pits for the removal of the buried munitions and additional training, testing, and protective equipment required for the asbestos removal.
- 1.3.4 The work was performed in a manner consistent with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 104, and the National Contingency Plan (NCP), Sections 300.120(d) and 300.400(e).

### **1.4 Technical Instructions**

- 1.4.1 The Final Work Plan, dated March 24, 2004, approved by the CEHNC on April 20, 2004, and succeeding Work Plan revisions detailed the OE identification, removal, and scrap certification procedures as stipulated in the SOW (Appendix A). It describes the method of accomplishing the work required by the Basic Contract and the SOW (Appendix A).



- 1.4.2 The Data Item Descriptions (DID) identified in Table 1.1, *Applicable Data Item Descriptions*, were in effect when the SOW was issued and the Delivery Order was awarded, and were applied to the work performed. The USACE's Munitions Response (MR) DID's were not applicable to this Delivery Order.

TABLE 1.1 - APPLICABLE DATA ITEM DESCRIPTIONS		
NUMBER	DATE	TITLE
OE-005-01.01	02/10/01	Type II Work Plan
OE-005-02.01	02/10/01	Technical Management Plan
OE-005-03.01	02/10/01	Explosive Management Plan
OE-005-04.01	02/10/01	Explosives Siting Plan
OE-005-06.01	02/10/01	Site Safety and Health Plan
OE-005-07.01	02/10/01	Location Surveying and Mapping Plan
OE-005-08.01	02/10/01	Work, Data, and Cost Management Plan
OE-005-09.01	02/10/01	Property Management Plan
OE-005-11.01	02/10/01	Quality Control Plan
OE-005-12.01	02/10/01	Environmental Protection Plan
OE-015.01	02/10/01	Accidents / Incidents Reports
OE-025.01	02/10/01	Personnel / Work Standards
OE-030.01	02/10/01	Site Specific Final Report
OE-045.01	02/10/01	Report / Minutes, Record of Meetings
OE-055.01	02/10/01	Telephone Conversation / Correspondence Records
OE-060.01	02/10/01	Conventional Explosives Safety Submission
OE-085.01	02/10/01	Weekly Status Report

- 1.4.3 Table 1.2, *Major Submittal Documents*, shows related documents that have previously been submitted (under this Delivery Order) and the dates the document were submitted.

TABLE 1.2 – MAJOR SUBMITTAL DOCUMENTS	
DOCUMENT	DATE SUBMITTED
Final Work Plan	March 24, 2004
Work Plan Revision 1	April 26, 2004
Work Plan Revision 2	May 3, 2004
Work Plan Revision 3	May 7, 2004
Work Plan Revision 4	May 12, 2004
Work Plan Revision 5	June 24, 2004
Work Plan Revision 6	July 7, 2004
Site-Specific Final Report, Ordnance and Explosive (OE) Response Action, Sierra Army Depot, East Shore Honey Lake, BRAC Parcels, Herlong, California	September 2, 2004
Work Plan Field Modification No. 1	October 29, 2004
Work Plan Field Modification No. 2	January 12, 2005
Work Plan Field Modification No. 3	January 12, 2005
Work Plan Field Modification No. 4	February 9, 2005
Work Plan Field Modification No. 5	February 16, 2005

## 1.5 Aims and Objectives

- 1.5.1 ATI was to safely locate, identify, and dispose of all surface and subsurface metal, OE, and ordnance-related scrap the size of a 20mm projectile or larger located within the 1,049-acre of the East Shore Honey Lake BRAC Parcel as indicated in the SOW (Appendix A).

## 1.6 Probability of Solution or Accomplishment

- 1.6.1 A multiple phase approach was used to clear the 1,049-acre BRAC Parcel of East Shore Honey Lake. The site boundary was surveyed and staked, and the interior 100 ft by 100 ft grids were staked. In areas of light contamination (defined as 500 anomalies or less per grid), Surface Sweep Teams on foot conducted surface removal and “mag and flag” sweeps. Dig Teams followed behind and

investigated flagged subsurface anomalies. In those areas where grids contained 500 anomalies or above, the Dig Teams conducted “mag and dig” sweeps to clear grids. Appendix D contains the Grid Tracking Log listing anomaly counts; a list of ordnance items removed is provided in Appendix C. ATI is confident that all OE, ordnance-related scrap, and metal, the size of a 20mm projectile or larger, was removed from the area where clearance activities occurred.

## **1.7 Technical Approach**

- 1.7.1 ATI accomplished the project objectives by using Sweep Personnel and UXO personnel to conduct the OE response action with hand-held Minelab Explorer II detectors. All metal 20mm projectile in size or larger and OE-related materials were removed and disposed of in accordance with the SOW.

## **2.0 DISCUSSION**

### **2.1 Technical Effort of Work**

#### **2.1.1 *Work Schedule***

2.1.1.1 The following work schedule was used by ATI personnel at the East Shore Honey Lake work site, weather and surface conditions permitting: Monday through Friday 0600 hrs to 1630 hrs.

#### **2.1.2 *Survey and Mapping***

2.1.2.1 A California licensed surveyor performed all surveying of site boundary and internal grids. A Magellan 315 Global Positioning System (GPS) was used to obtain coordinates of OE.

#### **2.1.3 *Brush Clearing***

2.1.3.1 ATI used a brush hog to cut sagebrush. Brush cutting operations began July 12, 2004. Much of the East Shore removal area is barren and brush did not inhibit the operation. But in some areas, heavy brush slowed down the Sweep Team. Areas of heavy brush were not cleared of OE until brush cutting was completed. ATI requested approval for brush cutting to speed performance of the work to meet schedule and contractual obligations. The clearance operations were being performed satisfactorily, but the work was slow and the workers had to go around and through the brush slowly. The brush cutting was not necessary to adequately find anomalies and perform QA/QC activities. The specific locations of the brush cutting operations were not recorded, but most of it occurred in the northern and western portion of the parcel. The cutting blade was set at a height of 4-in. above ground surface to avoid hitting ordnance items. ATI did not cut grasses or trees. ATI ensured the blade was high enough so as not to cut or damage the root ball of sagebrush. ATI conducted brush clearing only in those areas where the sagebrush was very dense. ATI used OE avoidance precautions to provide safety to the operator by walking at least 200 ft in front of the tractor in areas where the operator could not clearly see the ground surface.

#### **2.1.4 *Function Test Range***

2.1.4.1 The BRAC parcel includes an area known as the Function Test Range, which encompasses an area of approximately 122 acres. The area was used to test/detonate various types of munitions. This area was heavily contaminated with OE and non-OE scrap. Clearance of this area also included excavation of

several pits used for munitions burial and performance of sift operations for the separation of the soil from the munitions.

2.1.4.2 ATI utilized a backhoe for the excavation of the buried munitions pits. The backhoe was fitted with protective works as per USACE requirements to ensure protection of the operation in the event of an unintentional detonation (see photo in Appendix E). The backhoe was used to excavate soils, and to haul larger pieces of pipe and scrap. All pits were excavated to the depth necessary for the removal of the buried munitions, and backfilled to grade upon completion of the clearance activities.

2.1.4.3 In one pit, two pieces of suspected asbestos-containing materials were encountered. Samples were subsequently analyzed, confirming the presence of asbestos (Appendix O). In order to ensure the protection of the workers' safety and health due to the presence of the asbestos, one team was subsequently sent for asbestos worker training. During the asbestos removal activities and excavation activities in the associated pits, air monitoring for asbestos was conducted and workers utilized appropriate personal protective equipment (PPE), including disposal coveralls and respirators. Results of the air monitoring for asbestos are provided in Appendix O. All results were below the regulatory requirement [Occupational Safety and Health Act (OSHA) Permissible Exposure Limit (PEL)]. Approximately two 5-gallon buckets of asbestos containing materials were collected from the excavation.

## 2.1.5 ***Buried Conex Box***

2.1.5.1 ATI excavated and disposed of a Conex Box that had been used for unknown testing at the site. ATI used mechanical equipment to remove the Conex as it was broken and cut apart. Once the Conex had been removed, ATI conducted a subsurface clearance of the area. The scrap from the Conex was disposed at a local landfill.

## 2.1.6 ***50-Caliber Hill***

2.1.6.1 Clearance of the 50-Caliber Hill was not included within the initial SOW. However, the scope was later modified to include the excavation and disposal of the specified lead-contaminated soils and subsequent clearance and grading of the hill. During a previous sampling effort (USACE-Sacramento, September 2004), lead had been detected in the soils at concentrations ranging up to 2,300 ppm (mg/kg). The sampling report recommended excavation and disposal of the lead-contaminated soils.

2.1.6.2 Prior to the excavation of the 50-Caliber Hill, ATI collected soil samples from three locations corresponding to the lead "hot-spots" and submitted them for

analysis via the Toxicity Criteria Leaching Procedure (TCLP), which is required for landfill disposal. The results were below the TCLP criteria (i.e., the soils were not classified as a hazardous waste) (Appendix N).

2.1.6.3 The 50-Caliber Hill was checked with magnetometers to ensure no OE items were contacted. ATI excavated the specified lead-contaminated soils (45 tons), which were subsequently shipped to the landfill at Kettleman City Landfill, Kettleman City, California. Copies of the analytical results (TCLP), waste manifests, and certificate of disposal are provided in Appendix N. Upon completion of the required excavation, 12 confirmatory samples were collected and provided to the USACE-Sacramento for field screening via x-ray spectroscopy for lead. One sample was also submitted for laboratory confirmation.

2.1.6.4 The results of the field screening indicated that all samples were below the method detection level. For the sample submitted for laboratory analysis, the reported concentration was 0.65 mg/kg, which confirmed that the soils with elevated lead concentrations (above 5 mg/kg lead) had been excavated. Field screening results and the analytical laboratory report are provided in Appendix N.

2.1.6.5 Due to the lead hazards, ATI personnel were dressed in appropriate PPE (disposable coveralls and respirators) for the excavation work. Air monitoring was also conducted to evaluate the associated hazards to the workers. The results were all below the applicable regulatory requirement (OSHA PEL) (Appendix N).

2.1.6.6 Following removal of the lead-contaminated soils, a clearance to depth of detection was completed on the 50-Caliber Hill, and the soils excavated and leveled to grade.

## 2.1.7 *Equipment*

2.1.7.1 The Minelab Explorer II Detector is a hand-held analog all metals detector that operates a Full Band Spectrum (FBS). The FBS circuit automatically transmits 28 frequencies simultaneously ranging from 1.5 kHz to 100 kHz. The Minelab Explorer II detector is capable of detecting subsurface ferrous and non-ferrous metals. The Minelab Explorer II can be programmed to recognize an item at different depths and orientation by expanding the library of the known items stored. The Minelab Explorer II has the sophistication to output three types of signals to indicate whether the item found is equivalent to the one the instrument has been programmed for and whether the found item is smaller or larger. The Minelab Explorer II also indicates on the control panel whether the item found was a ferrous or a non-ferrous item and the estimated depth to the item. The Minelab Explorer II uses a proprietary algorithm to eliminate the effects of local magnetic fields caused by magnetic minerals. Essentially, this means that the Minelab Explorer II has better filtering capability than previous models.

- 2.1.7.2 The Minelab Explorer II has been tested by the Army but not in rigorous blind tests. It is a frequency domain electromagnetic system similar to the Army's mine detectors. However, the Minelab Explorer II uses 28 frequencies while most systems use only one or two.
- 2.1.7.3 The Minelab Explorer II has been checked by CEHNC three times at the Motlow, Tennessee OE removal site.
- 2.1.7.4 Huntsville's USACE Center of Expertise has done many detection depth tests with the Minelab Explorer II at Redstone Arsenal.
- 2.1.7.5 In all cases, CEHNC personnel have determined that the Minelab Explorer II performs satisfactorily.
- 2.1.7.6 ATI has much experience with the Minelab Explorer II in Hawaii, at Waikoloa. Some of these experienced ATI workers from Waikoloa came to Sierra to train the site workers.
- 2.1.8 ***OE Response Removal Action***
- 2.1.8.1 The subsurface clearance action was done in accordance with the SOW. All OE operations complied with EP 385-1-95a, Basic Safety Concepts and Considerations for Ordnance and Explosive Operations. Only CEHNC-approved UXO personnel were used to perform UXO field-related tasks. ATI conducted the removal action in two phases at the Senior UXO Supervisor's (SUXOS) direction depending on the anomaly count appropriate for each grid.
- 2.1.8.2 The first phase was a "mag and flag" sweep of grids with expected anomaly counts lower than 500 flags by Surface Sweep Teams using Minelab Explorer II detectors to remove surface metal and flag subsurface anomalies. The Surface Sweep Teams consisted of a UXO Tech III and one UXO Tech II per six Sweep Personnel.
- 2.1.8.3 The second phase was the excavation of flagged anomalies by Dig Teams in grids previously swept by the Surface Sweep Team. The Dig Teams investigated all flagged anomalies and removed metal meeting the SOW acceptance criteria.
- 2.1.8.4 For grids with high anomaly counts, a "mag and dig" approach was used to conduct the subsurface clearance activities on grids. The Dig Teams investigated all anomalies and removed metal meeting the SOW acceptance criteria.
- 2.1.8.5 Operations began by surface removal of metal, flagging of subsurface anomalies, and/or detecting and clearing 100 ft x 100 ft grids of all OE materials and

ordnance-related scrap 20mm or larger. Sweep Teams using Sweep Personnel on foot conducted the surface clearance activities, and Dig Teams using UXO-qualified personnel investigated flagged anomalies and conducted subsurface clearance activities. All ordnance-related scrap was collected. When OE items were found, they were evaluated to determine if they were safe to move. During this clearance, all OE items found that were determined to be safe to move were transported to the on-site holding magazine. Ordnance-related scrap was picked up by a scrap dealer and disposed of in accordance with the Work Plan. Non-ordnance related scrap was taken to the local landfill for disposal. OE items that were acceptable to move were transported to the Holding Magazine pending shipment to Clean Harbors, Colfax, LA. OE items that were not acceptable to ship were disposed of by detonation on-site by the support/demo team. No scenario was encountered, as described in EP385-1-95a (Para 9.a and 9.c) that precluded detonating OE on-site.

- 2.1.8.6 Personnel used to conduct removal action clearance activities met the requirements and qualifications outlined in OE-25.01 of the basic contract. The team composition was as follows:
  - 2.1.8.6.1 The Surface Sweep Teams each consisted of one UXO Technician III and one UXO Technician Level II, per six Sweep Personnel.
  - 2.1.8.6.2 The Dig Team was made up of one UXO Technician Level III, up to six UXO Technician IIs and UXO Technician Is.
- 2.1.8.7 The number of teams (number of assigned personnel and team composition) was determined by the SUXOS based on the availability of personnel and job requirements.
- 2.1.8.8 The following describes the method ATI used for the surface clearance operations at East Shore Honey Lake.
  - 2.1.8.8.1 ATI was to safely locate, identify, and dispose of all surface and subsurface metal, OE, and ordnance-related scrap the size of a 20mm projectile or larger located within the 1,049-acre East Shore Honey Lake BRAC Parcel.
  - 2.1.8.8.2 The Sweep Personnel were lined up at intervals of 5 ft apart. Initially, there were no ropes or lines used to delineate sweep lanes. The effort to place-out lanes would have impeded the production effort. However, near the completion of the project, ropes were used due to reduced team size. The Sweep Personnel began sweeping throughout the grid in an echelon formation. The Sweep Personnel maintained 5-ft separation and in echelon due to the nature of the operation of the Minelab Explorer II. The Minelab Explorer II is an active detector, and if multiple units are operated too close together, each detector will produce false



signals. The sweepers swept through the grids laying a flag at each location that the Minelab Explorer II detected a subsurface anomaly. The sweepers verbally notified the UXO Tech IIs each time a flag was placed or a surface item was located. The UXO Tech IIs followed behind the sweepers helping to maintain proper distances, identifying and removing surface items, verifying sweeper-placed flags, checking dense brush to ensure coverage, and assisting the UXO Tech III. The UXO Tech III followed behind the sweep formation counting flagged anomalies as the sweepers announced them, documenting the quantities and weights of surface items removed, marking surface OE, and processing all information required for the grid. Sweep operations were conducted within a single grid as determined by the Team Leader.

- 2.1.8.8.3 The Sweep Teams were followed by Dig Teams to “mag and dig” the flagged anomalies in grids previously swept by the Surface Sweep Team. The Dig Teams investigated all flagged anomalies and removed metal meeting the SOW acceptance criteria. The SUXOS also directed Dig Teams to conduct the sub-surface clearance activities on grids with high anomaly counts. The UXO Tech III supervised the excavation process and logged all information onto the Team Leader Grid Sheet. The UXO Tech III directed the UXO Tech IIs and UXO Tech Is to begin investigation of flagged anomalies. Each UXO Tech II and UXO Tech I investigated anomalies as an individual. Anomalies were investigated as a two-person effort only when anomalies were at depths greater than 1 ft, a UXO Tech I believed the anomaly may be a likely OE item, or so directed by the UXO Tech III.
- 2.1.8.9 All OE items located were inspected by a UXO-qualified person to determine its condition, (i.e., live, armed, inert, etc.). OE determined to be live and unacceptable to ship or containing hazardous components were disposed of on-site by detonation. Items determined acceptable to move were placed in the on-site holding magazine.
- 2.1.8.10 Following the clearance of the entire parcel, it was verified that all OE, OE scrap, and non-ordnance scrap was disposed of properly, based on daily reports and waste management receipts.
- 2.1.8.11 Ordnance-related scrap that did not require demilitarization was collected for transport to the on-site holding area. The Team Leader assured that his team members handled only inert items during this process. The Team Leader certified that only inert, non-ordnance related items were left on the grid. Ordnance-related scrap was held in securable/sealable containers and was not commingled with other non-ordnance scrap. Ordnance-related scrap was picked up by a scrap dealer and disposed of in accordance with the Work Plan.
- 2.1.8.12 All live OE items located were logged and marked, and the GPS coordinates were taken prior to moving the items (Appendix C).

- 2.1.8.13 The disposal actions generated fragments and scrap; it was inspected and removed after disposal operations were completed. All detonation holes were backfilled to grade.
- 2.1.8.14 The SUXOS and/or an UXO Technician III were responsible for final determination of an OE item that was suspected to be live. At least two UXO personnel had to agree on the condition of an OE item before any removal action was attempted. In addition, the CEHNC on-site OE safety specialist had to concur before any removal action took place. Standard publications were researched, as required.
- 2.1.8.15 Upon discovery of suspected OE, the item was inspected to determine identification and condition. If the item was determined acceptable to move by a UXO Supervisor, it was transported to the Holding Magazine pending shipment to Clean Harbors, Colfax, LA. Approval was obtained from the on-site safety representative before any movement of OE or before demolition operations were conducted.
- 2.1.9 No complete submunitions were encountered.
- 2.1.10 No suspected chemical warfare materiel (CWM) was encountered.
- 2.1.11 ***Blow-in-Place Operations***
- 2.1.11.1 During this removal action, one item was encountered that was determined to be unacceptable to move, a fuzed M2A1 AP land mine. This item was subsequently disposed by blow-in-place operations.
- 2.1.12 ***On-Site Disposal of OE Items***
- 2.1.12.1 During site operations, one item (an unfired, fuzed 40mm projectile) was determined acceptable to move and transported and placed in the Holding Magazine (July 15, 2004). In August 2004, a replacement SUXOS was assigned to the Honey Lake site. As part of the transition activities, the new SUXOS performed an inspection of the ATI magazine. At that time, the SUXOS, identified an unfired MK2, 40mm with a MK27 nose fuze that had been previously placed in the magazine, that was considered too hazardous to safely ship off-site. The MK27 nose fuze was deteriorated to the point that the forward section of the fuze containing the striker was missing, thus exposing the firing pin. This fuze has an out of line detonator that is normally aligned by spin through the firing process. The fuze was also bent, indicating that possible internal safety features may have been overcome through the extreme forces sustained from open detonation. The fuze was heavily corroded and the condition of the fuze, post kick out from an open detonation, could not be determined. The

USACE Site Safety Representative was notified. The Safety Representative subsequently notified CEHNC and concurrence was received that the item was to be destroyed on-site by detonation (August 20, 2004).

2.1.13 ***Disposal and Venting of OE Items Acceptable to Move***

2.1.13.1 In accordance with the SOW and approved Work Plan, OE items that were acceptable to move were transported to the Holding Magazine pending shipment to Clean Harbors, Colfax, LA. Clean Harbors packaged the OE items, which were then transported to Colfax, LA for disposal. The shipping documents are provided in Appendix L.

2.1.14 ***OE Scrap Processing and Disposition***

2.1.14.1 Ordnance-related scrap the size of a 20mm projectile or larger found while sweeping the grids was inspected by a UXO Technician II or III to verify the item was inert or safe to handle before moving.

2.1.14.2 The ordnance-related scrap was placed into containers for collection while sweeping. The material was partially segregated by type of metal, shrapnel/fragments, or ordnance.

2.1.14.3 Before the collected material left the grid, the UXO Technician III inspected it again.

2.1.14.4 The UXO Site Safety Officer (UXOSO) was responsible for ensuring that all procedures for certification of the scrap metal were followed. The UXOSO performed random checks of the processed OE.

2.1.14.5 Once inspection had taken place, the materials were loaded onto a truck or Gator for transportation to the demilitarization/storage area. The materials were then downloaded and placed in appropriate containers. Items requiring demilitarization and/or venting went into the holding containers until processed.

2.1.14.6 All final processed material was placed in securable/sealable containers for security. Upon completion of the clearance of the entire parcel, the materials were transported to Scott Surplus, 34560 Daggett – Yermo Road, Daggett, CA, 92327 [phone number (760) 254-3252] for sale to a foundry. Scott Surplus provided a Smelter Letter of Understanding to ATI (Appendix M) describing the procedures for when scrap is sold to a foundry. Receipt for pick up of the OE scrap is provided in Appendix I.

2.1.15      ***Non-OE Scrap Processing and Disposition***

2.1.15.1      Non-ordnance related scrap was transported to a local landfill for disposal.

2.1.16      ***Lessons Learned***

2.1.16.1      ATI mobilized personnel to the site after receiving Work Plan approval and permission to proceed on April 20, 2004. Shortly thereafter, several Work Plan changes were received from California agencies and Sacramento COE. Multiple revisions to the Work Plan contributed to errors that continued to haunt the project for several weeks. Mobilization to a project should begin when all Work Plan comments have been incorporated.

2.1.16.2      The use of John Deere Gators made the clearance operations go much quicker and safer. They were used to move OE items to the magazine, scrap around and off the grid, and to transport personnel around the project site.

2.1.16.3      Because of the distance from the office to the site (approximately 8 miles), mobile phones were used to communicate between the clearance site and the office. Radios were used for the communication between teams on the project site.

2.1.16.4      Use of the Minelab Explorer II works very well when sweeping over flat and even terrain with no vegetation to limit the height of the detector from the ground nor interfere with the operators sweeping motion. The operator is required to maintain a consistent and uniform sweeping motion for the detector to work at its optimum performance. Holding the instrument closer to the ground and going around vegetation or uneven ground required the operator to work slower, resulting in the higher number of anomalies smaller than the 20mm projectile criteria, resulting in investigating more anomalies than expected. The QA/QC process ensures that the clearance met the performance standards.

2.1.16.5      There was a learning and experience curve associated with using the Minelab Explorer II as there is with any new technology. ATI personnel working on-site had not previously used this detector. ATI expended time training personnel and as personnel gained experience and confidence with the detector, production and efficiency were gained.

2.1.16.6      Upon receipt of the final boundary survey, it was determined that several partial grids located along the property boundary had not been staked and cleared. However, the Dig Teams had removed the grid stakes from the completed grids. This required that the surveyor re-stake the partial grids to allow for their clearance.

- 2.1.16.7 During the removal operations, the SOW was revised to include an additional 27 acres. However, the area was staked using an alternate coordinate system (state-plane coordinates instead of UTM10 coordinates). This resulted in a slight misalignment between the original surveyed area (the main parcel) and the additional 27 acres. Although the entire area was subsequently cleared, additional effort was expended to confirm the grid survey for the 27 acres, and to clarify the grid nomenclature. Future work must ensure that a consistent grid system is used.
- 2.1.16.8 During the clearance activities, only 1 grid was recorded as a QC failure whereas 33 grids failed QA. From a review of the data, it is evident that many more grids were reswept without being recorded as a QC failure. Data needs to be entered into the database in a consistent manner.
- 2.1.16.9 During the early phases of the project, the USACE on-site OE safety specialist was unfamiliar with the site acceptance criteria, and failed a number of grids based on a too stringent interpretation of the criteria (i.e., less than a 20mm projectile size). The acceptance criteria need to be clearly understood by all project participants.
- 2.1.16.10 Finally, these trends should have been addressed early in the field program to allow identification and implementation of any required corrective actions
- 2.1.16.11 For this project, USACE utilized an “on-board” technical review process. Key reviewers and the ATI Project Manager reviewed the draft report in concert, using a video projection of the report. Comments were discussed and a team resolution was reached. This process avoided additional printing of documents for interim reviews, and saved significant time.

### **3.0 DOCUMENTATION**

#### **3.1 Final Report**

3.1.1 This Final Report summarizes and/or includes all relevant project documentation. Project documentation is described below and is included as appendices to this report, as appropriate.

##### **3.1.2 *Submittals***

3.1.2.1 In addition to the Draft and Final Removal Report, the SOW requires the submittal of Draft and Final Work Plans, as well as Weekly Status Reports.

##### **3.1.3 *Photographs***

3.1.3.1 Still photography was used to document all phases of the project. Representative photographs of all phases of the work are included in Appendix E.

##### **3.1.4 *Daily/Weekly Reports***

3.1.4.1 The ATI SUXOS completed daily reports to log daily production and significant events, and to inform the ATI Project Manager of project status and significant issues. Daily Reports are included in Appendix F. The reports cover the period of May 4, 2004, through February 22, 2005.

3.1.4.2 The ATI Site Project Manager completed Weekly Status Reports to log significant events, and to inform CEHNC of project status and significant issues.

##### **3.1.5 *Quality Conformance Inspection Records***

3.1.5.1 The project QC Specialist was responsible to ensure compliance with all quality aspects of the Work Plan. He inspected all major tasks and documented the results in Quality Conformance Inspection Record (QCIR). The QC Specialist performed a minimum of 10% QC Inspection (QCI) of each grid following the subsurface clearance prior to CEHNC QA checks. Copies of QCIRs are included as Appendix G of this report.

3.1.6      ***CEHNC Form 948***

- 3.1.6.1      CEHNC Form 948s were completed to document all safety and QA inspections by the Government. Copies of the forms are provided in Appendix H. One Form 948 was issued for a safety violation based on technical direction issued by the Project Manager. Due to the Form 948, the technical direction was rescinded by the Project Manager, resulting in immediate correction of the violation prior to its implementation. Thus, the safety violation was in fact a safety comment. No further safety violations occurred during this project.

## **4.0 TESTS**

### **4.1 Quality Conformance Inspections (QCI)**

- 4.1.1 As the Sweep Team completed the surface clearance and removed all the OE, and ordnance-related scrap from a grid a QCI was conducted by the ATI UXOQCS. A total of 4,990 grids were QC'd. Of those, 1 grid failed its QCI. This grid was re-cleared, corrective actions were identified, and the grid passed a subsequent QCI. The results of the QCI were recorded in the QCIR; a copy of the QCIRs is included in Appendix G. After completion of the QCI, the UXOQCS informed the government's on-site representative that the grid was ready for QA inspection; a CEHNC Form 948 was issued indicating the grid had been presented for QA inspection (Appendix H).

### **4.2 Quality Assurance Inspections**

- 4.2.1 The Government performed QA checks on each grid as the removal activities were completed. A total of 4,990 grids were turned over for QA. Of those, 33 grids failed their initial QA check. These grids were subsequently re-cleared and passed QA inspections. Results of the QA checks were documented on CEHNC Form 948s. Copies of each CEHNC Form 948 received are included in Appendix H.

### **4.3 Calibration Test Plot**

- 4.3.1 ATI constructed a metal detector "calibration test plot" on the site for the initial programming of Minelab Explorer II signal response levels and daily metal detector function test. The items placed in the "calibration test plot" were:
- One each inert 20mm projectile buried at 6 in. vertical and horizontal.
  - One each inert 20mm projectile buried at 12 in. vertical and horizontal.
  - One each inert 37mm projectile buried at 18 in. vertical and horizontal.
- 4.3.2 The Minelab Explorer II was set up to detect a 20mm projectile, ferrous or non-ferrous, at 12 in. in a vertical orientation; therefore, all metals at other orientations would also be detected.



## **5.0 FINANCIAL BREAKDOWN**

A summary of the financial breakdown is provided in Appendix J.

## **6.0 SUMMARY**

### **6.1 Work Performed**

- 6.1.1 The project has been completed and work performed at East Shore Honey Lake BRAC Parcels, Sierra Army Depot, in accordance with the Deliver Order, the SOW, and the approved Work Plan. A subsurface clearance of all metal the size of a 20mm projectile and larger was completed on 4,990 grids (100 ft x 100 ft) (1,049 acres). This includes the wetlands and archeological/cultural sites within the boundary of the project.

### **6.2 OE Items Found**

- 6.2.1 A total of 708 OE items have been recovered from the area. All of the OE items (excluding the two items disposed of on-site via detonation) were shipped via R&R Trucking to Clean Harbors Colfax, LLC, 3763 Highway 471, Colfax, LA 71417 (Appendix L).

- 6.2.2 Of the 708 OE items found:

- 68 of the OE items were found on the surface;
- 204 of the OE items were found at depths from 0 to 6 in.;
- 41 OE items were found from 6 to 12 in. below the ground surface;
- 94 OE items were found from 12 to 24 in. below the ground surface;
- 268 OE items were found from 24 to 36 in. below the ground surface;
- 33 OE items were found at depths below 36 in. below the ground surface.

It should be noted, that over most of the parcel, OE items were generally found at depths of less than 12 in. below the ground surface. However, in the Function Test Range, OE items were found at deeper depths. (This area included the excavation of several pits of buried munitions as described in Section 2.1.4). The majority of items recovered at depths greater than 12 in. were from pits of buried munitions although some scattered items were recovered. The deepest anomaly was found at a depth of 55 in. below the ground surface.

### **6.3 Report Description**

- 6.3.1 This report describes the site, the removal action, and the results. It includes data, information, and documentation related to the project in the appendices.

## **7.0 CONCLUSIONS**

In accordance with the requirements in the SOW (Appendix A), the Honey Lake BRAC Parcel has been cleared to depth of all surface and subsurface metal, OE, and ordnance-related scrap the size of a 20mm projectile or larger based on current technology. Items were detected to depths of 55 inches below the ground surface. Clearance of 100% of detected ferrous materials is not a guarantee of clearance.

## **8.0 RECOMMENDATIONS**

This section not required by the SOW.